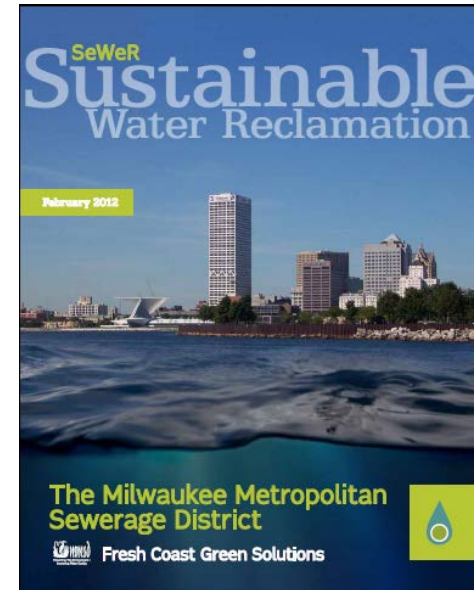
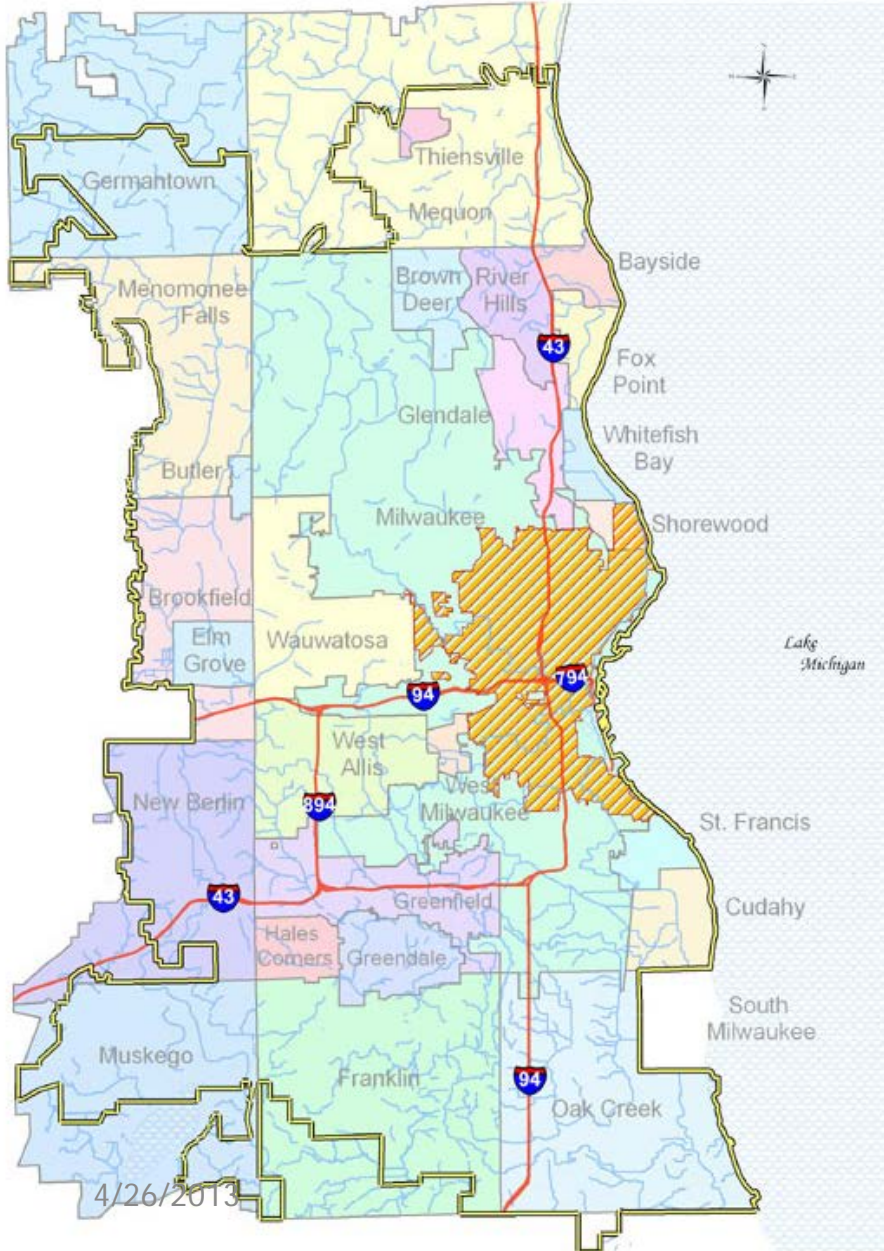


Milwaukee's Climate Change Initiatives

*Kevin L. Shafer, P.E.
Executive Director*



Milwaukee Metropolitan Sewerage District



We Serve:

- 1.1 Million Customers
- 28 Municipalities
- 411 Square Miles

We Protect the Public & Lake Michigan:

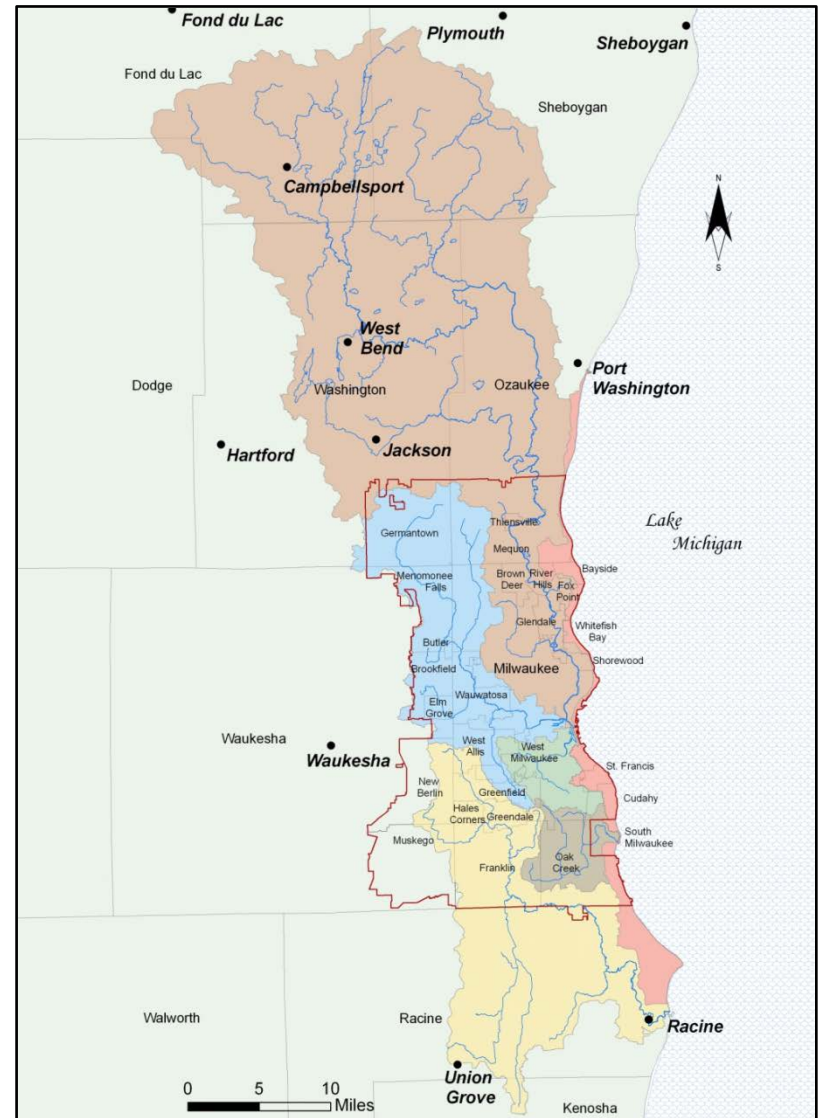
- Convey/Store/Reclaim Wastewater
- Manage Flooding

We Have:

- 300 Miles of Sewers (municipalities and individuals have 6,000 miles!)
- 521 MG Tunnel System
- 2 Water Reclamation Facilities

Greater Milwaukee Watersheds

- Watersheds Are...
- Watershed Boundaries ≠ Political Boundaries
- We're all upstream and downstream.



Water Reclamation Facilities



Jones Island



South Shore



ORGANIC NITROGEN

Milorganite®

FERTILIZER



Deep Tunnels

A photograph showing a large, circular tunnel under construction. The tunnel is made of concrete and has a rough, unfinished interior. A smaller, more finished tunnel is visible inside the larger one, creating a tunnel-in-tunnel effect. A small, dark object, possibly a vehicle or piece of equipment, is visible at the end of the inner tunnel. The lighting is dim, with some light reflecting off the wet floor of the inner tunnel.

300 Feet
Below ground

521 Million
Gallons of Storage

28.5 Miles
Long

17- to 32-feet
In Diameter

Designed to
minimize basement
backups and for 1-2
overflows per year.

% OF VOLUMES CAPTURED & CLEANED

TOTAL
PERCENT CAPTURE
98.21%

1994	99%	2000	95%	2006	99%
1995	98%	2001	99%	2007	99%
1996	99%	2002	99%	2008	95%
1997	97%	2003	100%	2009	98%
1998	99%	2004	97%	2010	96%
1999	94%	2005	99%	2011	99%

2012 Year to Date = 99.9999%

We've Had Extreme Storms

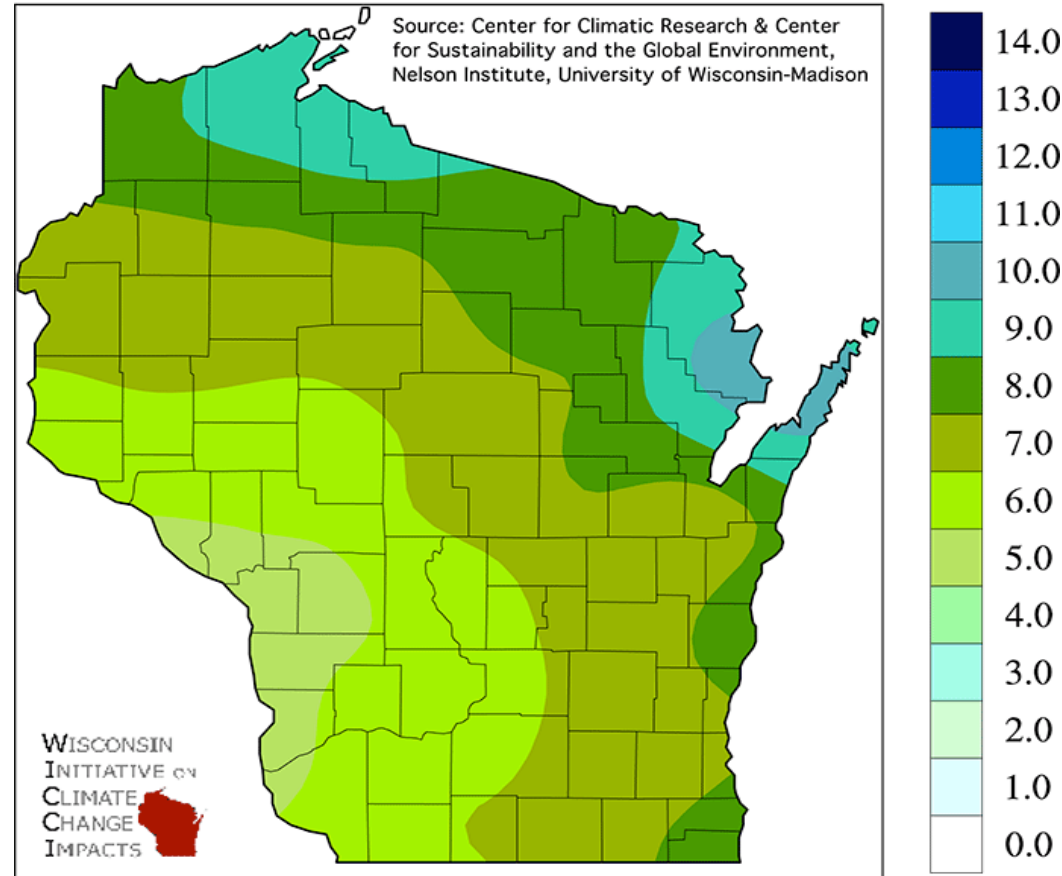


What Are Our Difficult Conditions?

*More Heavy, Long-duration
Rain*



Projected Change in the Frequency of 1" Precipitation Events
(days/decade) from 1980 to 2055 (A1B)



MMSD's 2035 Vision

(<http://v3.mmsd.com/NewsDetails.aspx>)

Integrated Watershed Management Goals:

Zero sanitary sewer overflows

Zero combined sewer overflows

Zero homes in the 100-year floodplain

Acquire an additional 10,000 acres of river buffers through Greenseams®

Use green infrastructure to capture the first 0.5 inch of rainfall

Harvest the first 0.25 gallons per square foot of area of rainfall

Energy Efficiency and Climate Mitigation & Adaptation Goals:

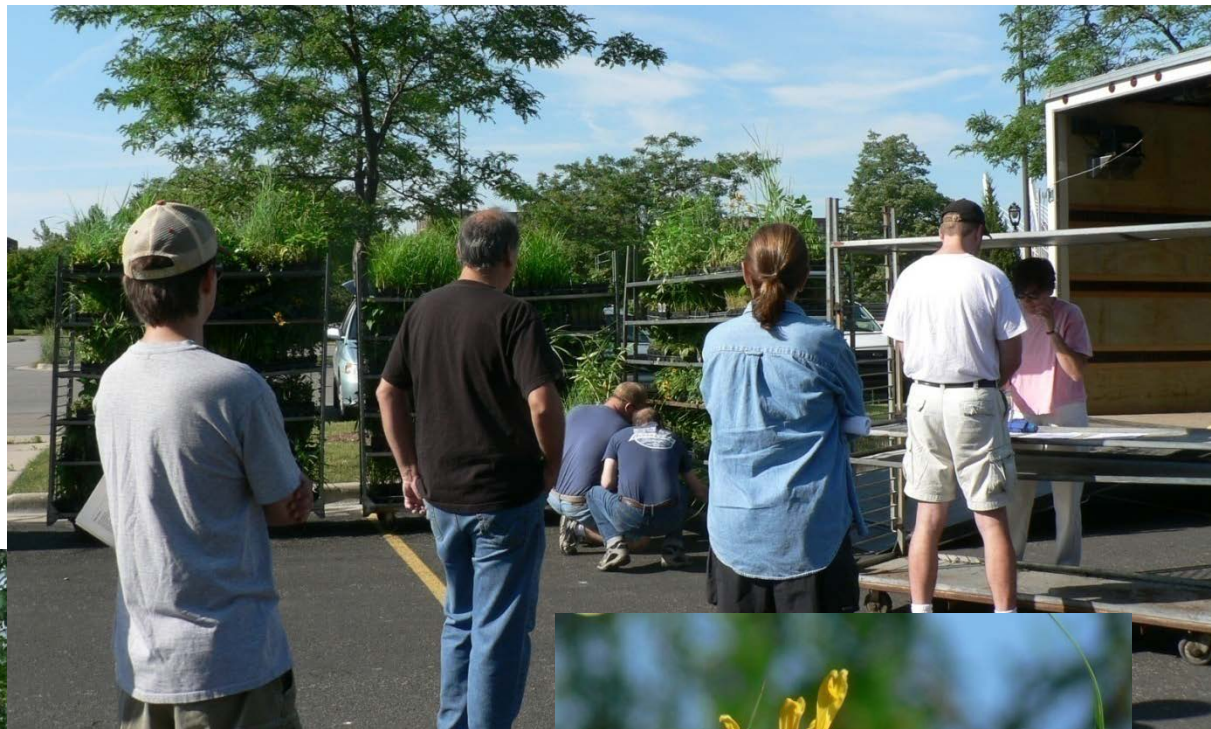
Meet 100% of MMSD's energy needs with renewable energy sources

Meet 80% of MMSD's energy needs with internal, renewable sources

Use the Greenseams® Program to provide for 30% sequestration of MMSD's carbon footprint

Reduce MMSD's carbon footprint by 90% from its 2005 baseline





18,000 Plants Sold Since 2006

mmmsd Rain barrels



More than
18,000
SOLD
Since 2002

Green Roofs

8+ acres

since 2003



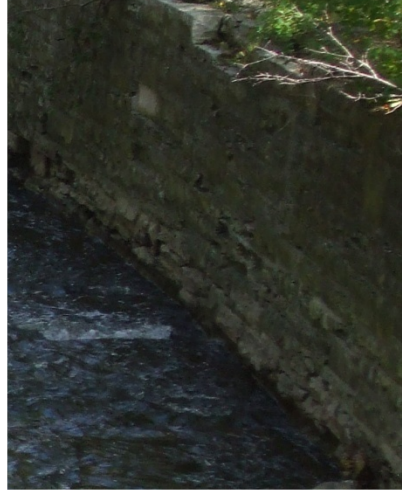


Before



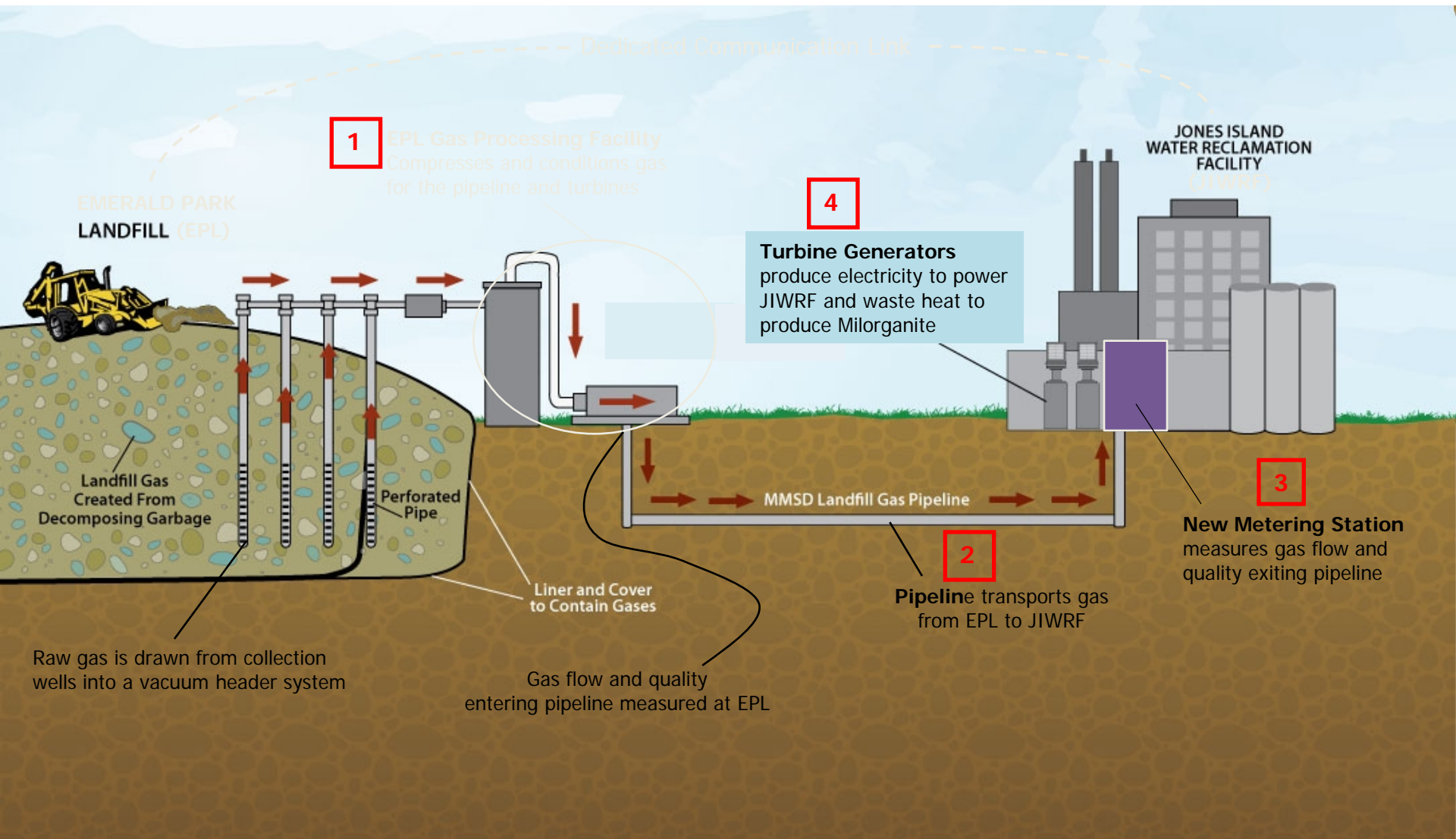
After

Menomonee River

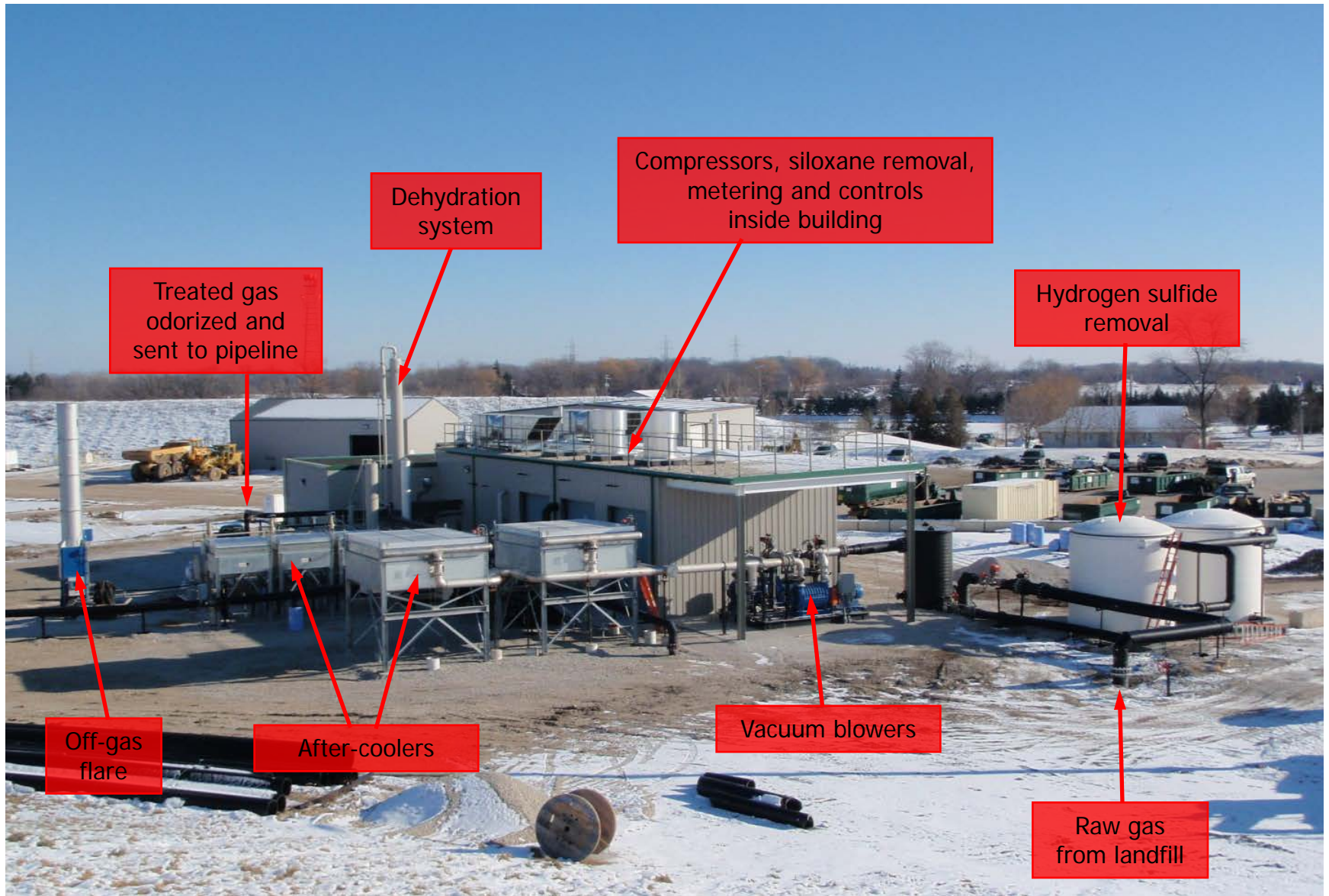


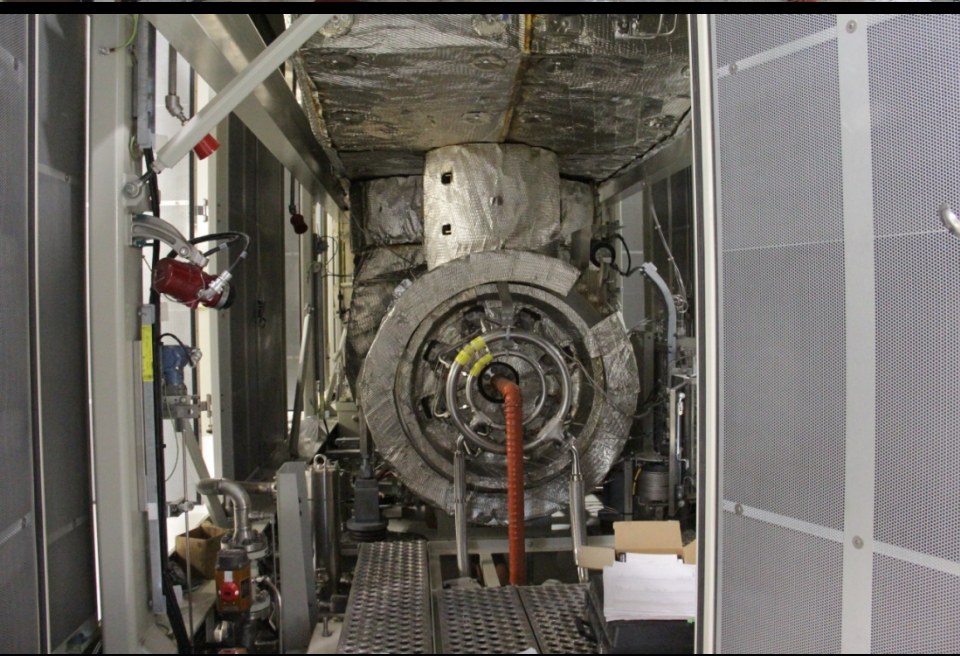
Watershed Permitting

Landfill Gas Project



Emerald Park LFG Processing Facility

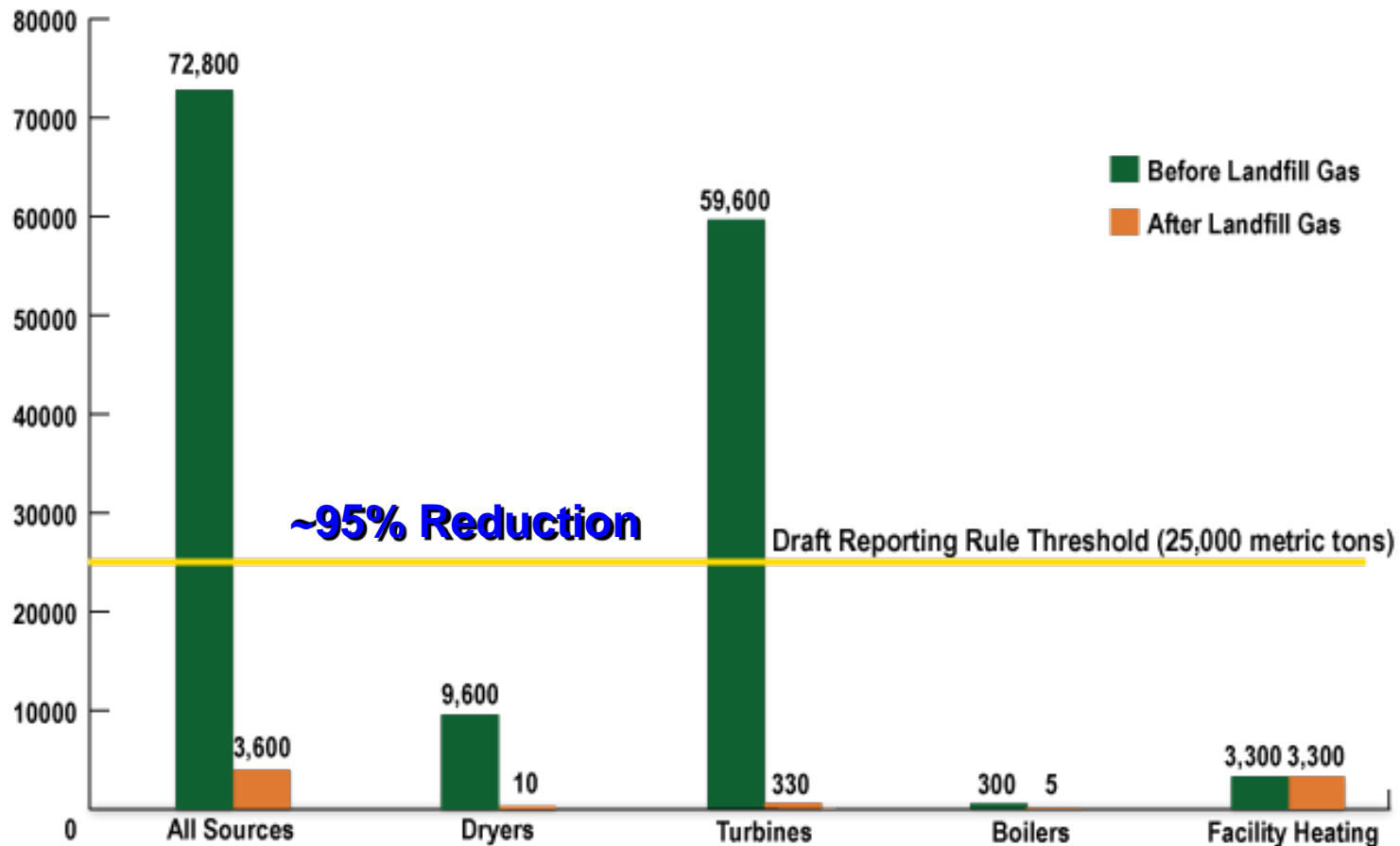




Jones Island Stationary Combustion Sources

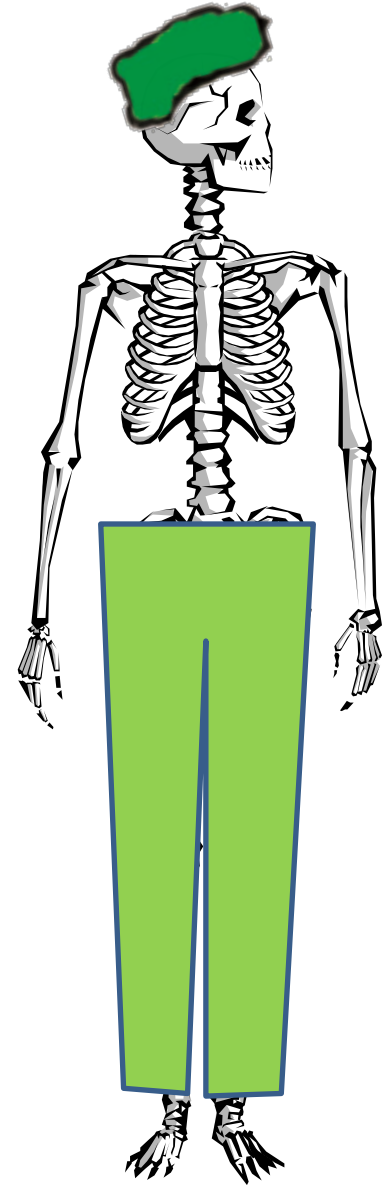
Before and After Landfill Gas Project (based on 2007 fuel usage data)

GHG Emissions in Metric Tons of Equivalent CO₂



Key Points

- All of the climate preparedness work was accomplished without a permit requirement or a consent decree
- The integration of grey and green Infrastructure, **ecostructure**, will help Milwaukee be more prepared for climate change
- Ecostructure approaches can save money!



QUESTIONS?



Milwaukee Metropolitan Sewerage District